

## *Southern California Oceanography MLPA South Coast Study Region*



Dr. John Largier

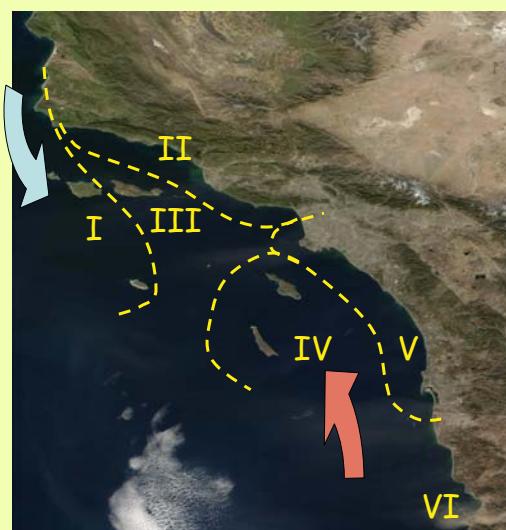
MLPA Master Plan  
Science Advisory  
Team

Draft Presented  
December 17, 2008  
in Los Angeles, CA

## *Developing an Oceanographic Perspective for MLPA in S. CA*

-- Currents &  
Connectivity

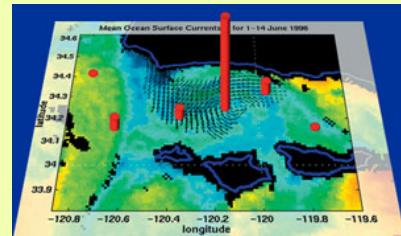
-- Water type &  
Habitat



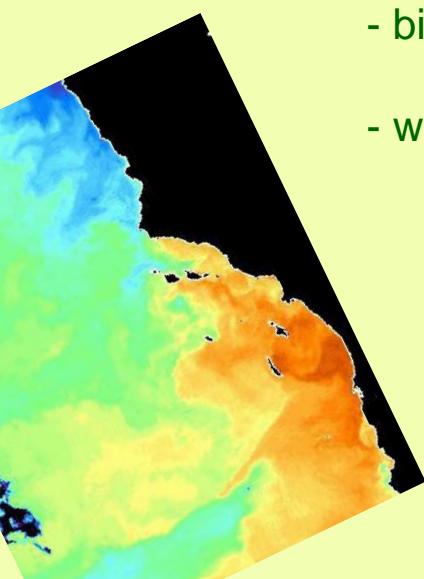
## **Connectivity**



- typical circulation pattern
- variability ...
  - ... predictable currents?
  - ... “stochastic” dispersion?
- features



## **Habitat**



- biogenic water properties  
(SST, Chl)
- water quality,  
i.e., contaminants



## Southern California Oceanography, MLPA SCSR

### Habitat

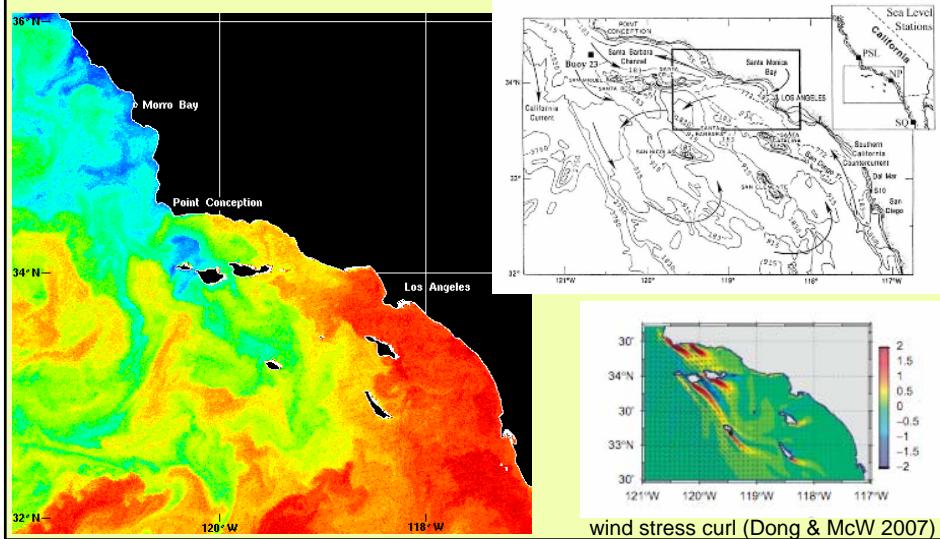
- biogenic water properties (SST, Chl)
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i.e., contaminants



## Southern California Oceanography, MLPA SCSR

### Large-scale circulation

schematic (Hickey 1992, 2003)



## Southern California Oceanography, MLPA SCSR

### Large-scale circulation

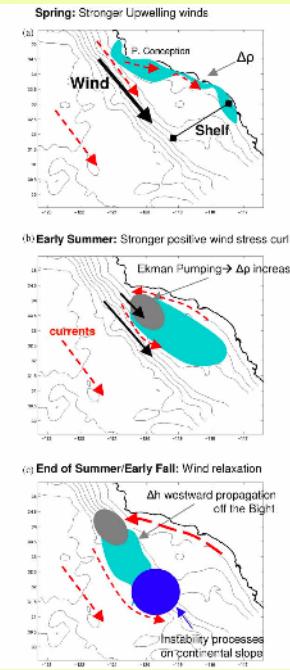
Seasonal evolution ...

... spring: winds & upwelling

... summer: winds relax inshore,  
curl & Ekman pumping,  
SC Counter-current  
Southern California Eddy

... fall: broadening recirculation  
becomes unstable

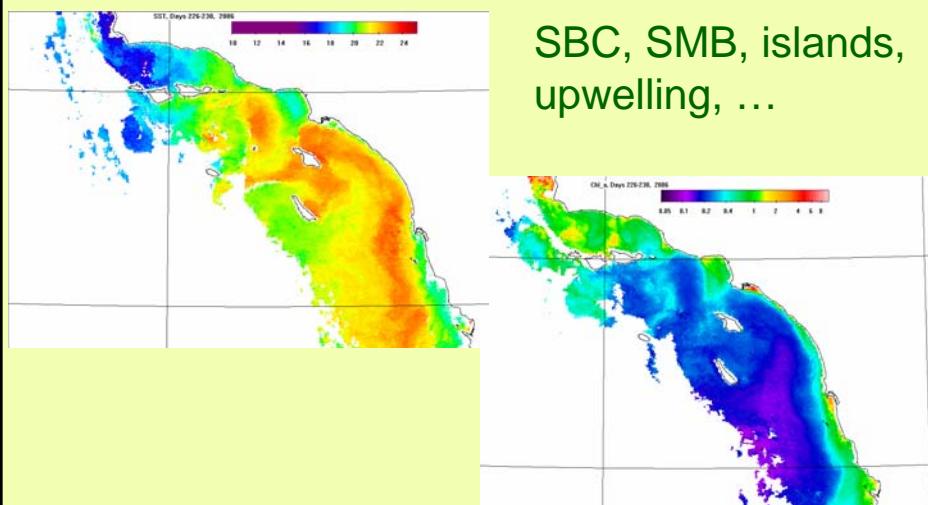
seasonal dynamics (Di Lorenzo 2003)



## Southern California Oceanography, MLPA SCSR

### Multiple scales of patterns ...

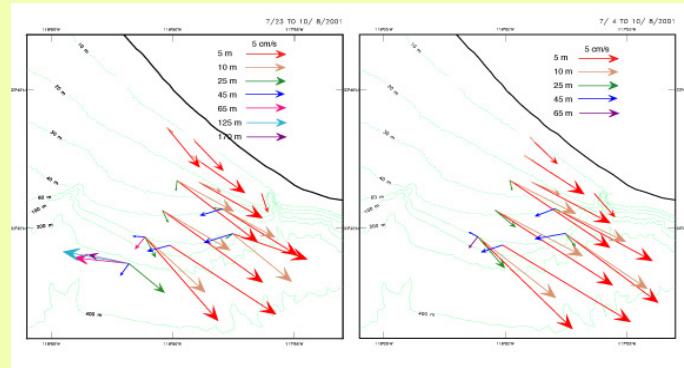
SBC, SMB, islands,  
upwelling, ...



Merged MODIS Aqua and Terra products. (Aug 13 - 17, 2006). Courtesy of M. Kahru and B.G. Mitchell, OPG Group, SIO

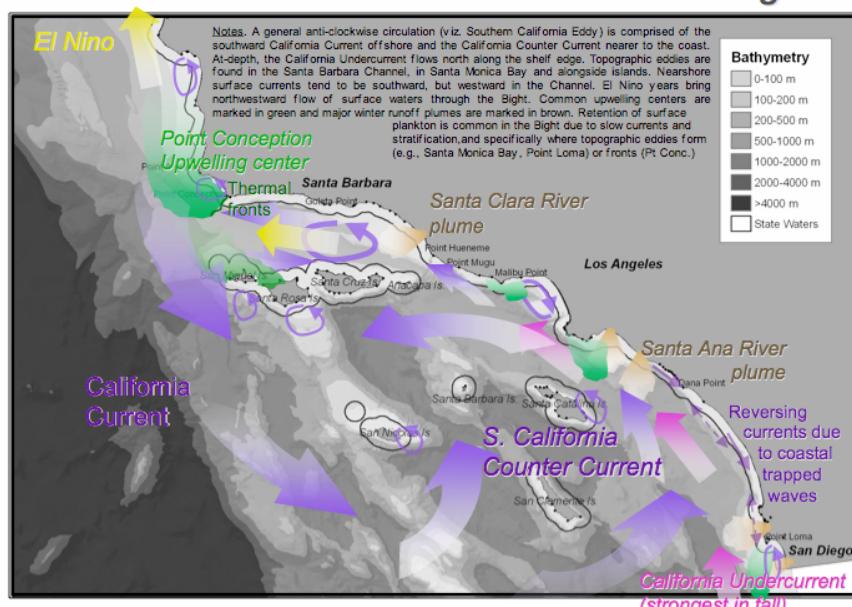
## Shelf currents

Southward currents over the shelf ...  
reversing at times (Oct-Nov?)



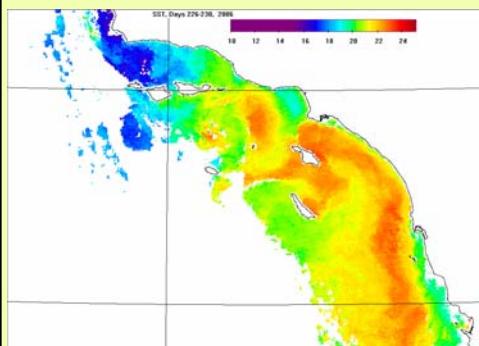
Huntington Beach (Noble et al 2004)

## Circulation in the Southern California Bight

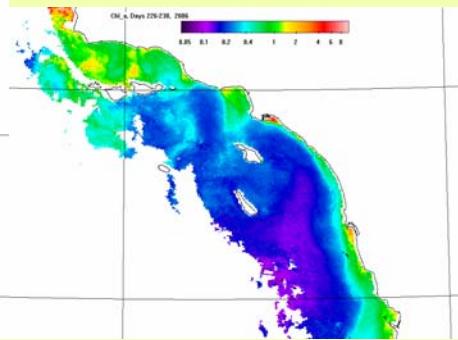


## Upwelling

Shallow thermocline throughout SCB, breaks surface at specific times & places

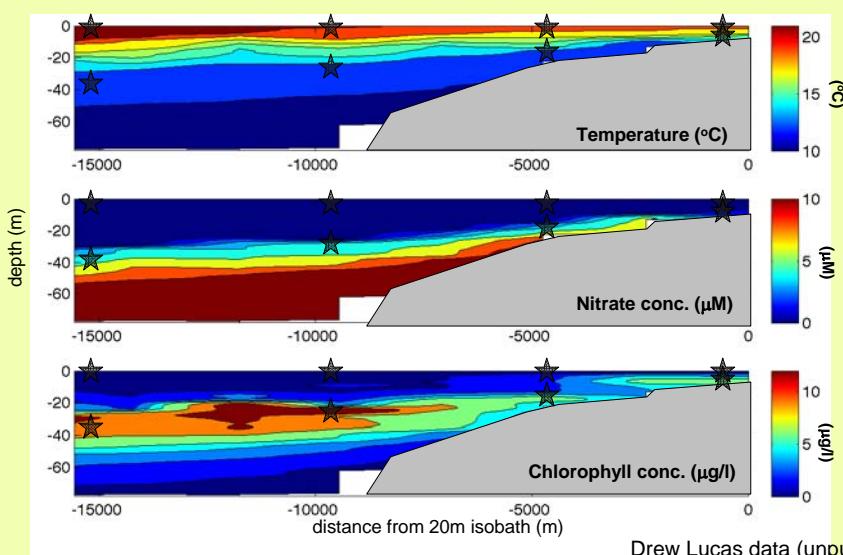


Pt Conception, Pt Dume,  
Palos Verdes, Pt Loma,  
S of border



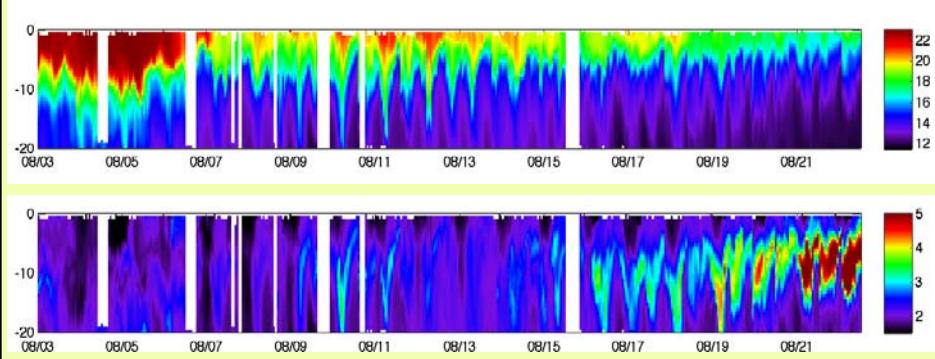
## Upwelling ... Shallow thermocline with Chl max

Cross-shore transects, shelf break to the inner shelf :



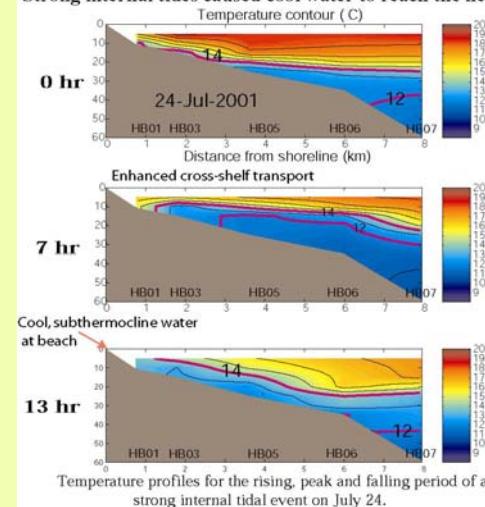
## *Internal Waves ... and other HF motions*

Temperature, fluorescence, (08/03 - 08/23/2006; 25 m WW):



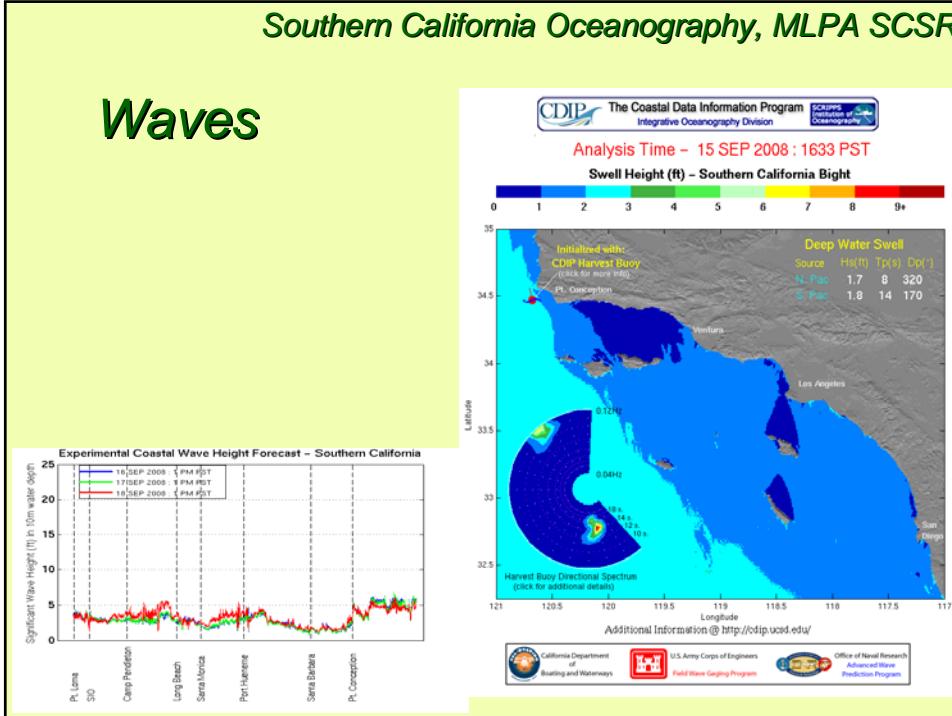
## *Internal Waves ... and other HF motions*

**Strong internal tides caused cool water to reach the nearshore.**



## Southern California Oceanography, MLPA SCSR

### Waves



## Southern California Oceanography, MLPA SCSR

### River and tidal plumes



## River and tidal plumes

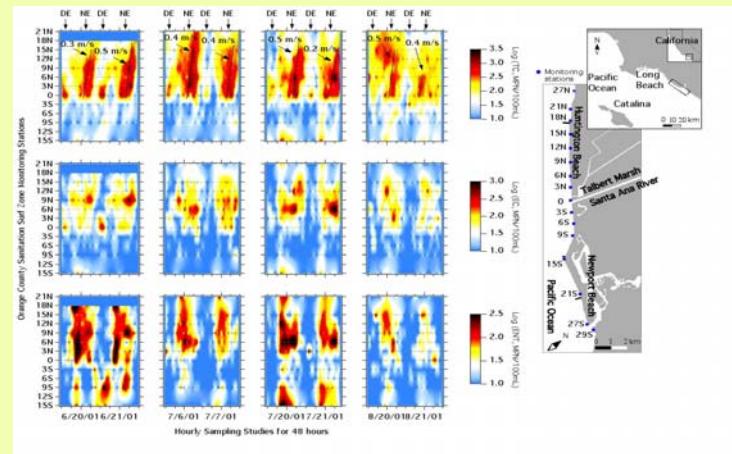


Figure 2  
Kim et al.

## Developing an Oceanographic Perspective for MLPA in S. CA

-- Currents & Connectivity

-- Water type & Habitat

